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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/790,716	03/03/2004	Masayoshi Takahashi	Q79574	2616

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EXAMINER	
DOUGLAS, JOHN CHRISTOPHER	
ART UNIT	**PAPER NUMBER**
1764	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/04/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/790,716	TAKAHASHI ET AL.	
	Examiner	Art Unit	
	John C. Douglas	1764	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 January 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Examiner acknowledges the response filed on 1/22/07 containing remarks.

Applicant's arguments, see remarks, filed 1/22/2007, with respect to the 112 rejection have been fully considered and are persuasive. The 112 rejection of claim 1 has been withdrawn.

The remainder of the rejection is maintained:

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein

were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 1, 4-6, 8, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Holloway (US 6521248).

5. With respect to claims 1, 4, and 18, Holloway discloses a method of making a micro-cluster water (a hydrate, see Holloway, column 6, lines 27-30) by subjecting water to cavitation such that dissolved entrained gases in the water form a plurality of bubbles and reducing the pressure of the liquid to cause the bubbles to implode (see Holloway, claims1, 3, and 10).

6. With respect to claim 5, Holloway discloses where the bubbles are generated by subjecting water to a first pressure between about 55 psig and about 120 psig followed by a rapid depressurization to a second pressure at about 1atm (see Holloway, claims 6 and 8).

7. With respect to claim 6, Holloway discloses that the gas is dissolved into water at larger quantities due to increased partial pressure (see Holloway, column 5, lines 52-59).

8. With respect to claim 8, Holloway discloses that the bubbles are generated by pressurizing the water into a rotational volute to create a vortex that reaches partial

vacuum pressures releasing entrained gases as bubbles (see Holloway, column 5, lines 25-29).

9. Claims 2, 3, 7, and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Holloway in view of JP 2000-000447.

10. With respect to claim 2, Holloway discloses everything in claim 1 (see paragraph 8), but does not disclose where the bubbles have a diameter of less than 50 micrometers.

However, JP discloses generating bubbles having diameters of 20 micrometers (see JP, paragraph 3).

JP discloses that bubbles having diameters of 20 micrometers allow for efficient dissolving of gases into the water (see JP, paragraph 2).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to modify the process of Holloway to include generating bubbles having diameters of 20 micrometers in order to allow for efficient dissolving of gases into the water.

11. With respect to claim 3, Applicant discloses that bubbles having a diameter of 1mm ascend at a rate of 100 mm/ sec or more and bubbles having a diameter of 50 micrometers ascend at a rate of 1 mm/sec or less (see Specification, paragraph 30). JP discloses bubbles with a diameter of 20 micrometers. Therefore, the bubbles of JP would ascend at a rate less than 1 mm/sec.

12. With respect to claim 7, Applicant discloses that the collapsing of the ultrafine bubbles would cause the gas hydrate to be formed at a region above the metastable

marginal curve (see Specification, paragraphs 26-27). Collapsing of ultrafine bubbles is taught by Holloway in view of JP (see paragraphs 8 and 13). Therefore, the gas hydrate to be formed at a region above the metastable marginal curve would be a necessary result from the prior art.

13. With respect to claim 9, JP discloses where the ultrafine bubbles are generated by a cylinder with a diameter that becomes gradually smaller such as a wine bottle configuration, which would be similar to Applicant's bell configuration in Figure 1 (see JP, paragraph 14).

Response to Arguments

14. In response to applicant's argument that Holloway is nonanalogous art, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, Holloway discloses all the claimed limitations of claim 1, namely: subjecting water to cavitation such that dissolved entrained gases in the water form a plurality of bubbles and reducing the pressure of the liquid to cause the bubbles to implode (see Holloway, claims1, 3, and 10). Therefore, the process disclosed should also make a gas hydrate, since the process of Holloway is the same as claim 1.

Conclusion

15. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John C. Douglas whose telephone number is 571-272-1087. The examiner can normally be reached on 7:30 A.M. to 4:30 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn A. Caldarola can be reached on 571-272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JCD

3/30/2007

Supervisory Patent Examiner
Technology Center 1700